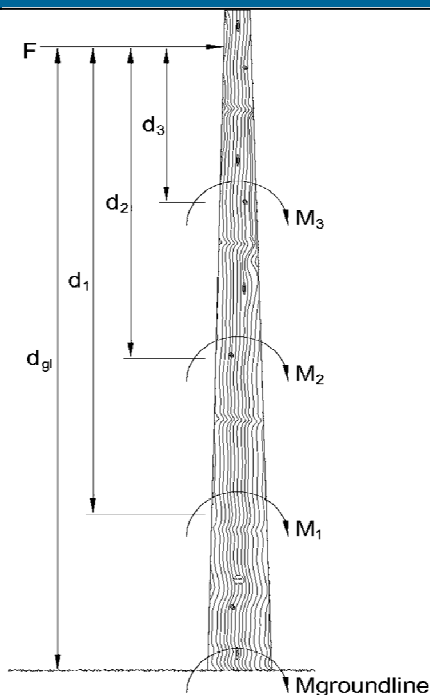




**Marne and Associates, Inc.**  
Experts in Electrical Code

## eLearning Solutions: Distribution Line Design (Overhead)



$$M_r = F_s K_r F_b C_g^3$$

10 on-line eLearning Modules (10-20 minutes)

“A great class for understanding the calculations that your software program is doing.”

- ◆ Provides a general overview of each part of the NESC
- ◆ Designed for:
  - Engineers
  - Staking Technicians
  - Estimators
  - Designers
  - Others involved with Distribution Line Design
- ◆ Rich in graphics and practical applications

**Conforms to the 2012 National Electrical Safety Code® (NESC®)**

# eLearning Solutions: Distribution Line Design

10 on-line eLearning modules (10-20 minutes each)

## About the eLearning Course

Distribution Line Design is a self-guided class consisting of 10 modules as well as 6 homework problems and a solutions guide. Each module is 10-20 minutes long. A printable certificate of completion is available upon completion of the class. During this class you will learn about:

- ◆ Various conductor types
- ◆ How to apply sag charts
- ◆ Tangent pole design for wood poles
- ◆ Guyed pole design for wood poles and various guy wire types
- ◆ Joint use and make ready calculations

## Who Should Attend

- ◆ Engineers
- ◆ Staking Technicians
- ◆ Estimators
- ◆ Designers
- ◆ Others involved in Distribution Line Design

## Class Format/ Learning Methods

- ◆ On-line, self-paced study
- ◆ Recorded narrated presentation slides rich in graphics and practical applications
- ◆ Moodle (learning management system) keeps track of progress throughout the training
- ◆ Ability to email questions to the instructor

## Course Objectives

Upon successful completion of this course the learner will be able to:

1. Understand how conductors and sag charts apply to distribution line design calculations.
2. Apply the NESC Loading Districts and strength and overload factors to distribution line design calculations.
3. Recognize how the NESC is integrated into distribution line design calculations for tangent and guyed wood poles.
4. Identify common distribution line design construction limits.
5. Design and build facilities that comply with Code requirements.
6. Understand the actions needed to increase structure strength for joint use attachments.

## Benefits of eLearning

- ◆ Classes are designed around the learner
- ◆ On-demand access means learning can happen precisely when needed
- ◆ Travel time and associated costs are reduced or eliminated
- ◆ Professional quality presentations
- ◆ Classes created and taught by industry experts
- ◆ Training can be tracked to determine each employee's training status

## Continuing Education Units

This course provides 0.45 Continuing Education Units (CEUs) or 4.5 Professional Development Hours (PDHs). Please note that the CEU/PDH for this class have been approved by New York State.

## About the Instructor

**David J. Marne, P.E.**, is a registered professional electrical engineer. Mr. Marne is the author of McGraw-Hill's National Electrical Safety Code® (NESC®) Handbook and is a nationally recognized speaker on the NESC. He serves on NESC Subcommittee 4 Overhead Lines Clearances, Subcommittee 7 Underground Lines, Subcommittee 3 Electric Supply Stations, and the Interpretations Subcommittee. He is company president and senior electrical engineer for Marne and Associates, Inc. in Missoula, MT where he specializes in National Electrical Safety Code (NESC) training, OSHA training for power and communication workers, engineering design training, and expert witness services related to the NESC, the OSHA Standards for Power and Communication workers, and California's General Orders GO95, GO128, and GO165. Mr. Marne has over 30 years of experience in the utility industry engineering and managing transmission and distribution line projects, substation projects, electrical system planning studies, joint use (power and communication) projects, and providing training and expert witness services.



**David J. Marne, P.E.**

# eLearning Solutions: Distribution Line Design

10 on-line eLearning modules (10-20 minutes each)

## Class Topics

### Conductors and Sag Charts (3 classes)

- ◆ Conductor Types
- ◆ Ruling Span Calculations
- ◆ Sag Chart Examples
- ◆ Calculating Clearances
- ◆ Required Clearances
- ◆ Maximum Allowable Span Based on Conductor Sag

### Tangent Pole Design I (2 classes)

- ◆ NESC Loading Districts and NESC Extreme Wind
- ◆ NESC Strength and Overload Factors
- ◆ Design Loads
- ◆ Pole Top Assemblies
- ◆ Maximum Allowable Span Based on Crossarm Strength (Vertical Span)

### Tangent Pole Design II (1 class)

- ◆ Pole Height and Class
- ◆ Allowable Moments
- ◆ Calculating Heavy/Medium/Light Pole Loading
- ◆ Calculating Extreme Wind Loading
- ◆ Maximum Allowable Span Based on Pole Strength (Wind Span)

### Guyed Pole Design I (2 classes)

- ◆ Pole Top Assemblies
- ◆ Crossarm Strength
- ◆ Guy Wire Ratings
- ◆ Basic Trigonometry for Guy Calculations
- ◆ Guy Lead and Attachment Height

## Class Topics (continued)

### Guyed Pole Design II (1 class)

- ◆ Pole Bucking Calculations
- ◆ Calculating the Minimum Guy Lead
- ◆ Determining the Guy/Anchor/Attachment “Weak Link”
- ◆ Soil Types and Anchor Selection

### Joint Use and Make Ready (1 class)

- ◆ NESC Joint Use Clearances
- ◆ Added Loads Due to Communication Circuits
- ◆ Make-Ready Survey of Existing Line
- ◆ Grounding and Guying Methods

## Enrollment/Pricing/Cancellation

- ◆ The Distribution Line Design eLearning class costs \$195.00 per eLearner for a 1 year subscription.
- ◆ eLearners register through Marne and Associates, Inc. website [www.marneassociates.com](http://www.marneassociates.com). Once registered, login instructions will be emailed to the enrollee to access the online class.
- ◆ Marne and Associates, Inc. does not offer a refund for eLearning classes at this time. It is the eLearner’s responsibility to make sure he/she has reviewed the class contents and system requirements prior to purchasing the class.

## Trademarks

National Electrical Safety Code® and NESC® are registered trademarks of the Institute of Electrical and Electronics Engineers (IEEE). OSHA (Occupational Safety & Health Administration) is a branch of the U.S. Department of Labor.

## Comments by Past Participants...

Enjoyed the course.  
Well done!

Very helpful and  
informative.  
Very appreciated.

Good presentation.  
Keep up the good  
work.

## Class Materials

- ◆ There are not hard copy materials for the eLearning class. The presentation is viewable on line anytime during the 1 year subscription period.
- ◆ Attendees are encouraged (but not required) to have a copy of the NESC Codebook, McGraw-Hill’s NESC Handbook, the RUS Distribution Design Bulletins, and the 12.47/7.2 kV Spec book. These books are available for purchase on [www.codehandbook.com](http://www.codehandbook.com).

